

SERVICE MANUAL



FISHER

PH-M25

**Stereo Microcassette Recorder
(EUROPE)**



THE FIRST NAME IN HIGH FIDELITY

SPECIFICATIONS

Power Source	DC 3V (AA Cell x 2))
Output Power	15mW x 2 (Max.)
Recording System	AC Bias
Power Consumption	700mW
Current Consumption (with Metal Tape/at Vol. min.)	
Record mode	107mA
Playback mode	90mA
Fast Forward mode	110mA
Rewind mode	110mA
Erasing System	AC Erasing
Tape Speed	
1.2cm	15/32ips. ±6%
2.4cm	15/16ips. ±3%
Wow & Flutter	0.18% WRMS
Fast Forward Time	185sec. (with MC-60 micro cassette tape)
Rewind Time	185sec. (with MC-60 micro cassette tape)
Frequency Response (Overall, at 2.4cm/sec.)	
Fe ₂ O ₃	80 ~ 8kHz
Metal	80 ~ 10kHz
Signal to Noise Ratio	
Fe ₂ O ₃	45dB
Metal	40dB
Erase Ratio (Overall)	
Fe ₂ O ₃	65dB
Metal	60dB
Crosstalk (with Fe ₂ O ₃)	
Track to Track	65dB
Channel Separation (with Fe ₂ O ₃)	35dB
Harmonic Distortion (K3)	
Fe ₂ O ₃	2%
Metal	3%
Input Sensitivity and Impedance	
Microphone	0.2mV/4.6kΩ
LINE IN	60mV/5.2kΩ
Output Impedance	
Headphone	32Ω
Oscillation Frequency	42kHz
Dimensions (W x H x D)	57 x 126 x 22mm
Weight	240g

—Specifications subject to change without notice.—

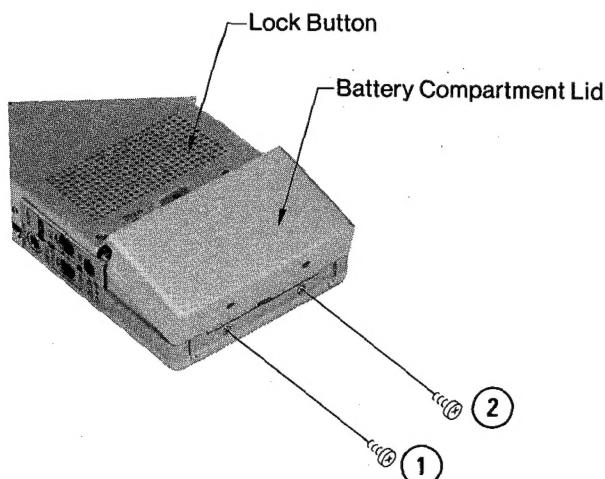
DISASSEMBLY INSTRUCTIONS

GENERAL REMARKS

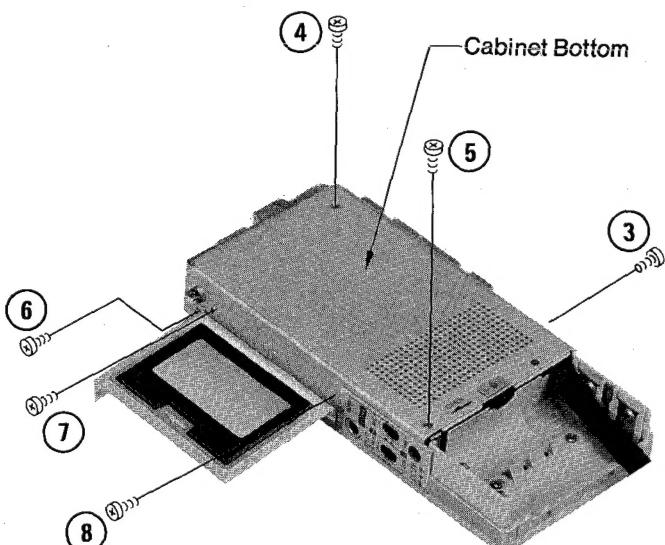
- Before disassembling the unit, spread a soft cloth or a rubber mat on the work bench to avoid scratches and grease spots.
- Do not spread anything which is likely to cause static electricity because transistors and ICs are easily broken by it.
- When the unit is reassembled, note the kinds of fastening screws, the arrangement of the leads, and the mounting condition of the parts. Please refer to the circuit diagrams and exploded views.
- Be sure to remove the cassette tape and the batteries from the unit before disassembling the unit.

CABINET BOTTOM REMOVAL

1. Remove the two fastening screws (1 and 2). Slide the Lock Button to the left and detach the battery compartment lid by lifting it in the direction of the arrow.



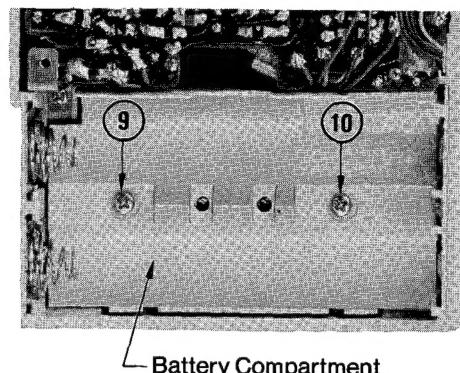
2. Open the cassette compartment lid and remove the six screws (3 ~ 8). Then, detach the Cabinet Bottom by lifting it in the direction of the arrow.



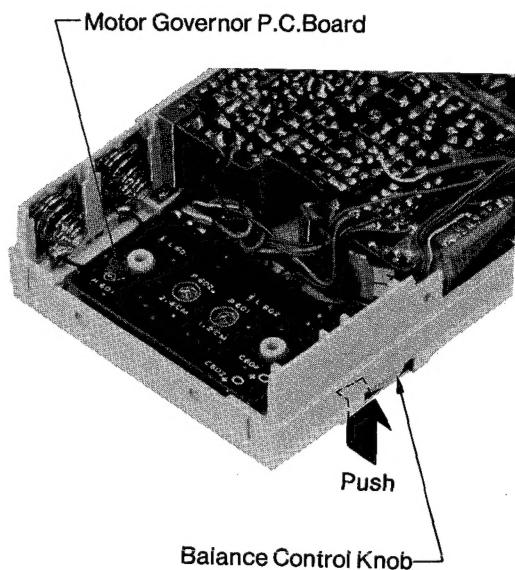
3. Reassemble in reverse order.

MOTOR GOVERNOR P.C.BOARD REMOVAL

1. Detach the Cabinet Bottom by following its removal instruction.
- Remove the two screws (9 and 10) and then, detach the Battery Compartment.



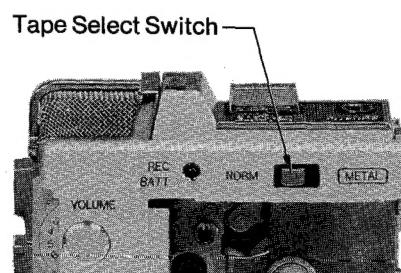
2. Lift the Motor Governor P.C. Board in the direction of the arrow and detach the P.C. Board by pushing the Balance Control Knob as illustrated.



3. Reassemble in reverse order.

MECHANISM CHASSIS REMOVAL

1. Pull out the Tape Select Switch Knob to avoid damage to the switch.

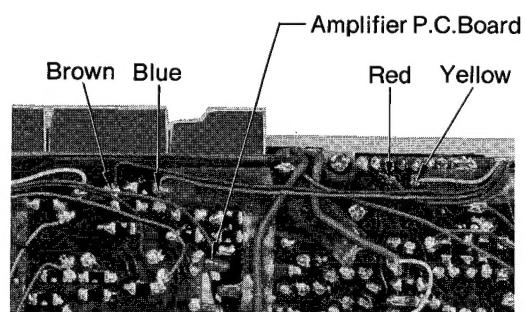
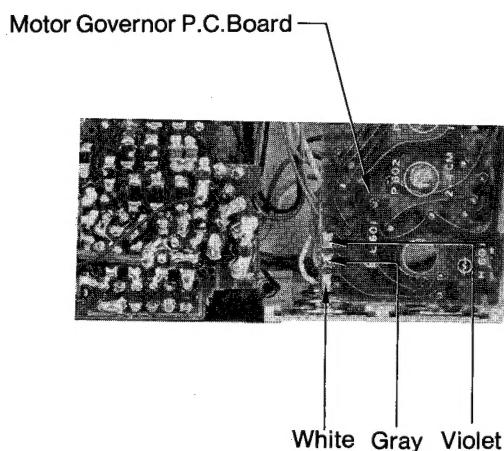
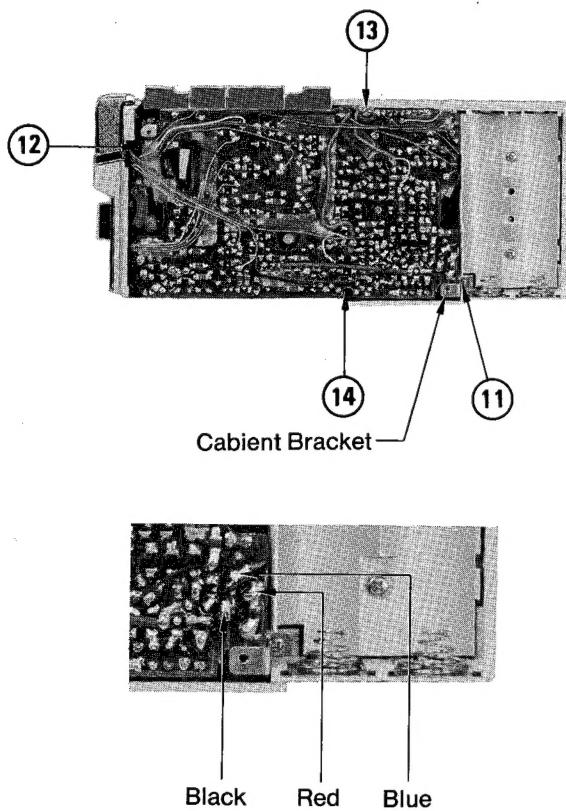


DISASSEMBLY INSTRUCTIONS (Continued)

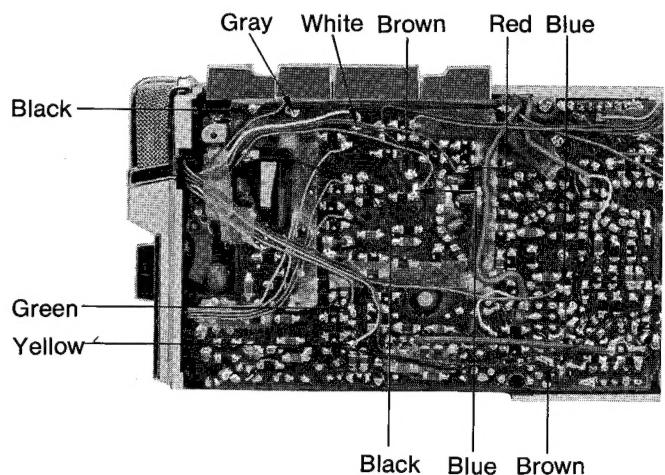
2. Detach the Cabinet Bottom by following its removal instruction and peel off the transparent film on the P.C. Board.
3. Detach the Motor Governor P.C. Board. Remove the screw (11) and then, the Cabinet Bracket.
4. Disconnect the following leads from the Motor Governor P.C. Board.
 - * Three leads (red, black, and blue) for the power supply
 - * Three leads (white, gray, and violet) running to the Tape Speed Switch

Disconnect the following leads from the Amplifier P.C. Board.

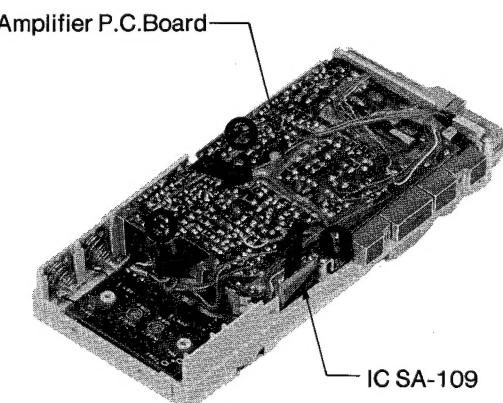
- * Four leads (yellow, red, blue, and brown)



5. Disconnect the following leads from the Amplifier P.C. Board.
 - * Eight leads (black, gray, white, green, brown, blue, yellow, and red) running from the Volume Control P.C. Board
 - * Two leads (red and white) running from the LED Indicator
 - * Three leads (black, brown, and blue) running from the built-in microphone



6. Remove the three screws (12 ~ 14) fastening the Mechanism Chassis.
7. Carefully lift the motor side of the unit in the direction of the arrow 1 until IC (SA-109) is separated from the Cabinet Top. Then, detach the Mechanism Chassis in the order of the arrows 2 and 3.



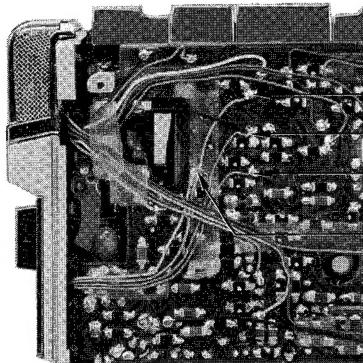
8. Reassemble in reverse order.

DISASSEMBLY INSTRUCTIONS (Continued)

AMPLIFIER P.C.BOARD REMOVAL

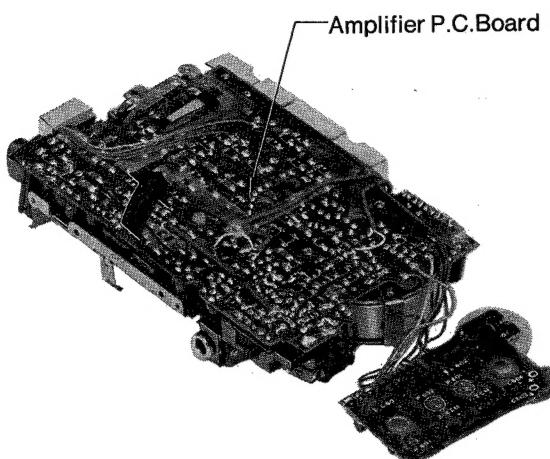
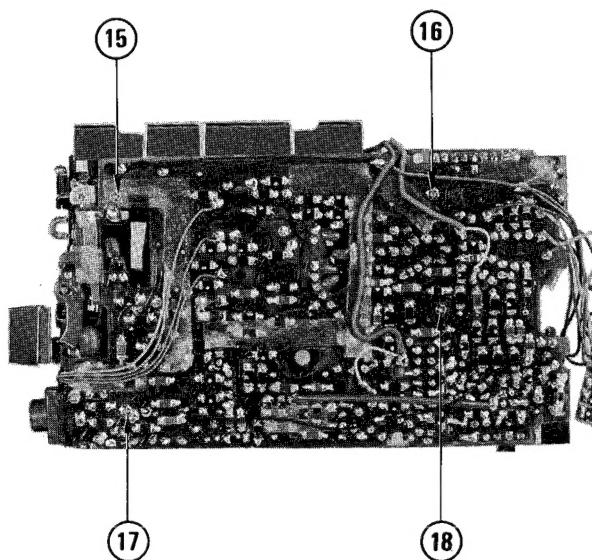
1. Detach the Mechanism Chassis from the Cabinet by following its removal instruction.

Then, disconnect the four leads (blue, gray, green, and yellow), running from the Tape Select Switch, from the Amplifier P.C.Board.



Green
Gray
Blue
Yellow

2. Remove the four screws (15 ~ 18) and detach the Amplifier P.C.Board by lifting it in the direction of the arrow.

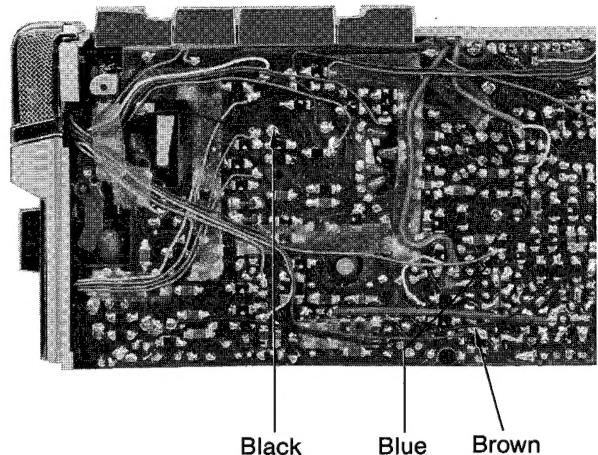


3. Reassemble in reverse order.

MICROPHONE ASSEMBLY REMOVAL

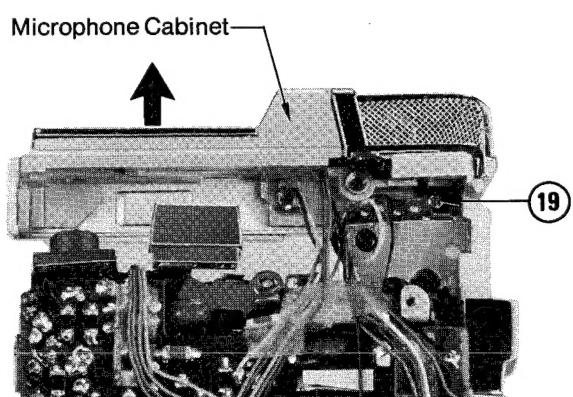
1. Detach the Cabinet Bottom by following its removal instruction and disconnect the three leads (black, brown, and blue) from the Amplifier P.C.Board.

Remove the three screws (12 ~ 14) fastening the Mechanism Chassis.

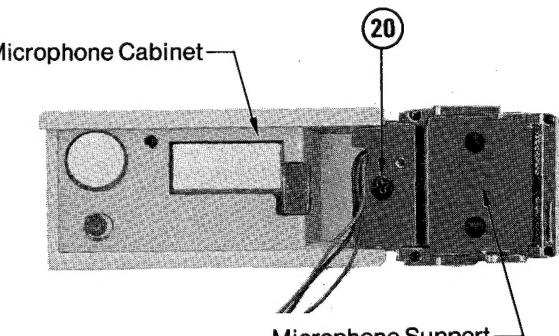


Black Blue Brown

2. Detach the Chassis without disconnect the leads and slightly shift it.
3. Remove the screw (19) and detach the microphone assembly by pushing it in the direction of the arrow.



4. The Microphone Assembly will be disassembled by removing the screw (20).

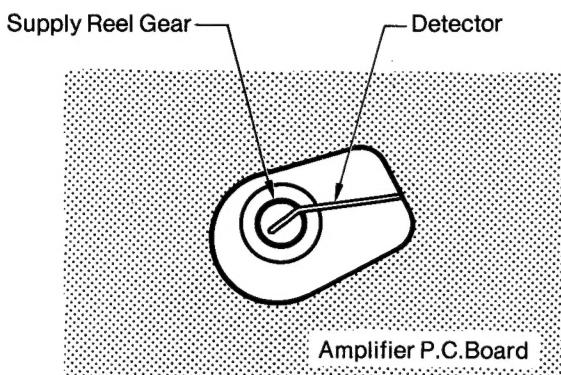


5. Reassemble the Microphone Assembly in reverse order, noting the lead arrangement.

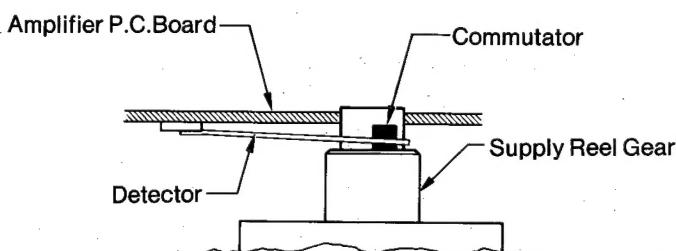
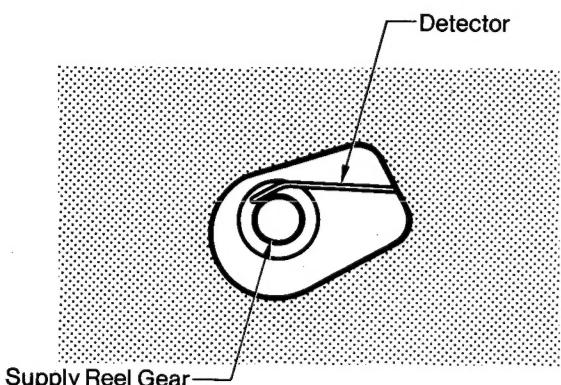
DISASSEMBLY INSTRUCTIONS (Continued)

NOTES ON AMPLIFIER P.C.BOARD MOUNTING

1. When the Amplifier P.C.Board is mounted to the Chassis, confirm that the resistors and capacitors do not touch the parts relative to the mechanical function.
2. After the Amplifier P.C.Board is mounted, check that the R/P Switch functions correctly.
3. Adjust the location of the Detector which detects the rotation of the Supply Reel as follows:
 - * Check to see that the Detector is located at almost the center of the Supply Reel Gear as illustrated when the Amplifier P.C.Board is correctly placed on the Chassis.



- * Move the Detector with a pair of tweezers as illustrated and then, check to see that the Detector touches the commutator of the Supply Reel Gear as illustrated. After that, tighten the fastening screw.

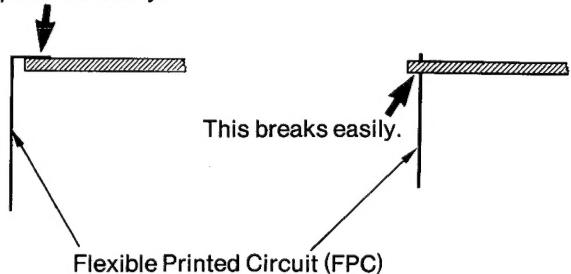


- * If necessary, adjust the Detector position by carefully bending the Detector.

NOTES ON HANDLING THE AMPLIFIER P.C.BOARD

1. Carefully handle the Flexible Printed Circuit (FPC) of the Hybrid IC4 (SA-109) because their junctions are very weak and FPC may be easily broken.

This peels off easily.



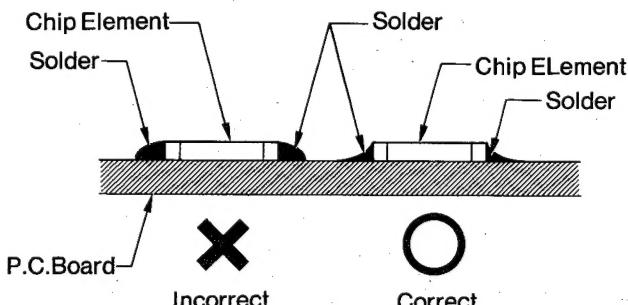
2. When the leads are arranged, pay due caution to the following items.

- * Do not pass the leads over the mounting holes of the Amplifier P.C.Board.
- * Do not place the leads on the chip element.
- * Do not place the leads on the leaf switch attached to Amplifier P.C.Board.
- * Do not lay the leads in piles.
- * Do not make the leads come out of the Amplifier P.C.Board.
- * Do not pull the leads forcibly.
- * Refer to the illustrated on **Page 7** for leads arrangement.

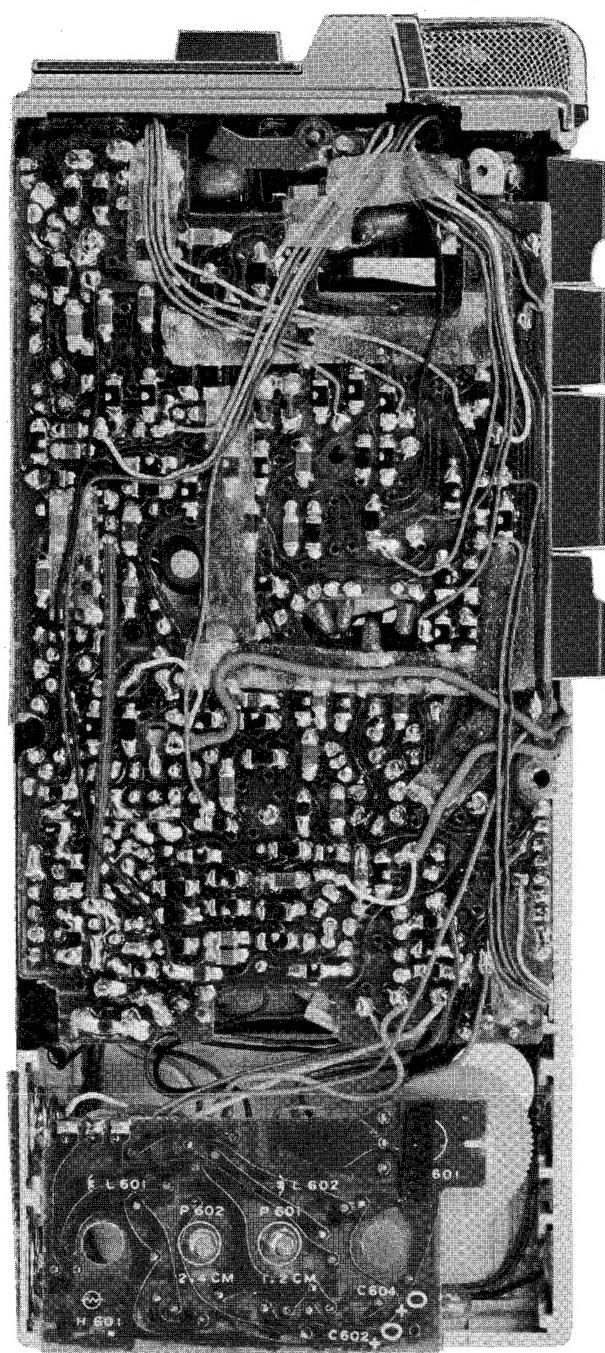
NOTES ON HANDLING THE CHIP ELEMENT

Pay due caution to the following items

1. Do not use the removed chip element again.
2. Use a soldering iron of less than 30W.
 - * The soldering iron should not touch the body of the chip element.
 - * Complete soldering in a short time.
 - * Apply solder to the chip element as illustrated below.



DISASSEMBLY INSTRUCTIONS (Continued)



MECHANICAL ADJUSTMENTS

GENERAL REMARKS

1. Use the External Power Source (Constant-voltage Regulator: 3.0V DC) whenever a repair or an adjustment work is performed.
2. Before adjusting the mechanism of the unit, wipe the tape contacting surfaces clean as well as the rubber surfaces of the driving parts with a soft cloth soaked in alcohol. Trouble may occur because of oil and grease stains.
3. Keep the belts clean while the adjustment are performed.

EQUIPMENT REQUIRED

- Microcassette-type Torquemeter
- Dial Tension Gause
- Plus Screwdriver (1.7mm)

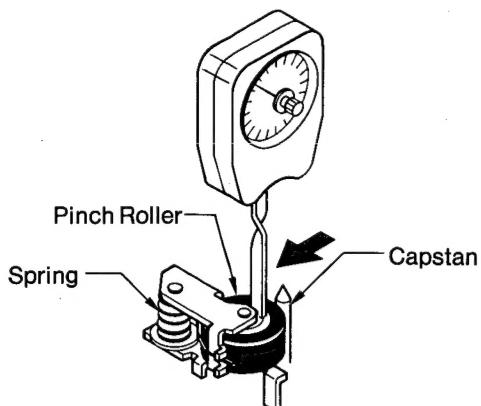
NOTE:

Set the Tape Speed Switch to "2.4cm" and perform a repair or an adjustment work.

PINCH ROLLER AJUSTMENT

1. Check the Pinch Roller. If the rubber surface has scratch marks or is deteriorated, replace it with a new one.
2. Set the unit in the playback mode and measure the pressure with the dial tension gauge by the following procedures:
 - * Hook the dial tension gauge to the Pinch Roller and pull the Pinch Roller off the Capstan as illustrated. Then, slowly bring the Pinch Roller close to Capstan.

Dial Tension Gauge
150 ~ 170g-cm

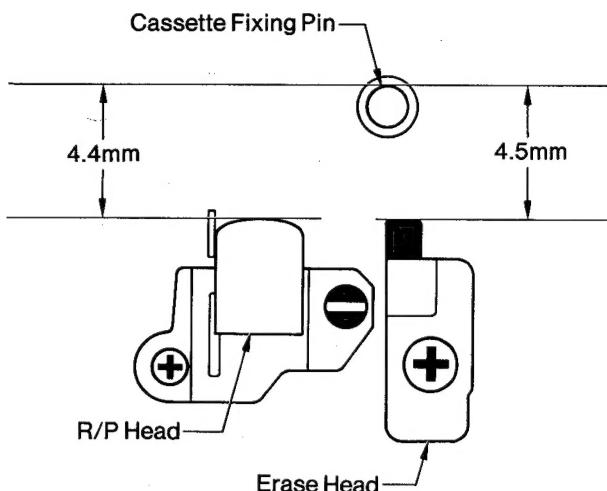


- * Measure the pressure the moment the Pinch Roller comes in contact with the Capstan and starts rotating. It should be 150 ~ 170g-cm.
- 3. If not, replace the Spring with a new one.

HEADS POSITION ADJUSTMENT

The distance between the Cassette Fixing Pin and each Head should be as follows when the unit is set in the recording mode.

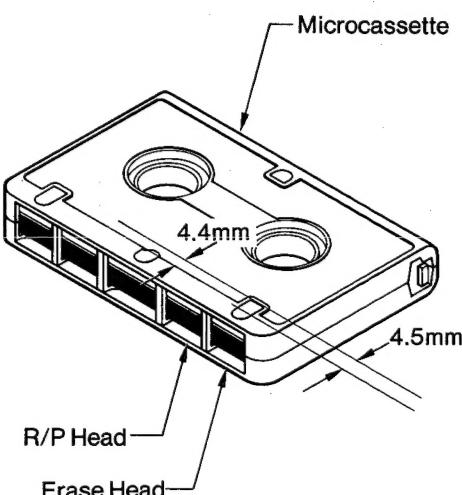
R/P Head: 4.4mm
Erase Head: 4.5mm



Perform the following adjustment whenever the Heads have been disassembled or replaced.

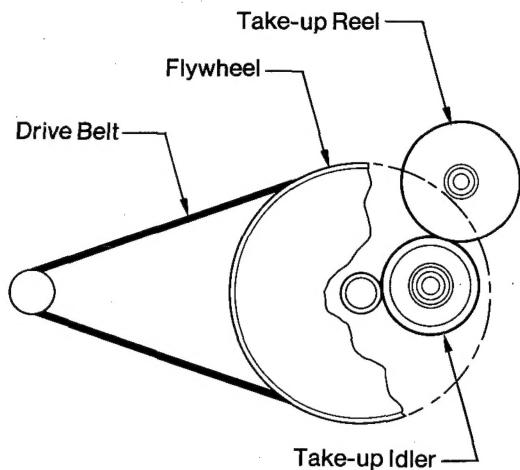
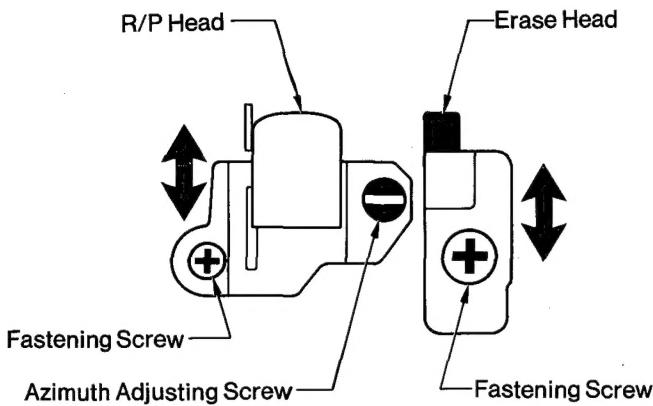
NOTE:

A cassette with the specified pin-head distances marked on it as shown can be used as a facilitating gauge for the Heads Position Adjustment. (Do not use a worn cassette.)



1. Mount the R/P Head on the Slide Base and move the Head to the specified position. Then, tighten the fastening screw and the azimuth adjusting screw.
2. Mount the Erase Head on the Erase Head Base and move the Head to the specified position. Then, tighten the fastening screw.

MECHANICAL ADJUSTMENTS (Continued)



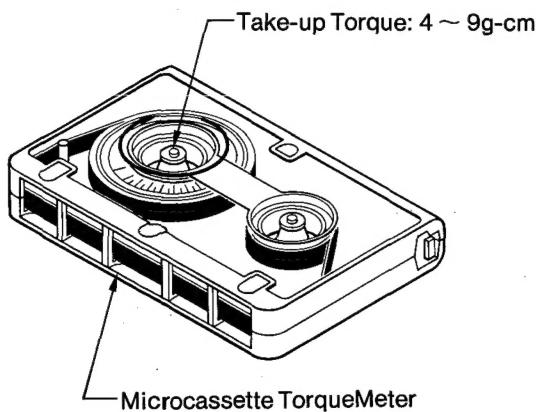
- Secure the screws fastening the R/P and Erase Heads with paint or glue.

NOTE:

- Secure the azimuth adjusting screw with paint or glue after the Azimuth adjustment.
- The Erase Head Lever should not be deformed when the screw is tightened to secure the Erase Head.
- If the Erase Head is not correctly positioned, the distortion factor of the recorded signals will deteriorate (especially in case of a Metal tape).

TAKE-UP TORQUE

- Insert the microcassette torquemeter into the cassette compartment and set the unit in the playback mode. Then, measure the take-up torque of the Take-up Reel. It should be 4 ~ 9g-cm.

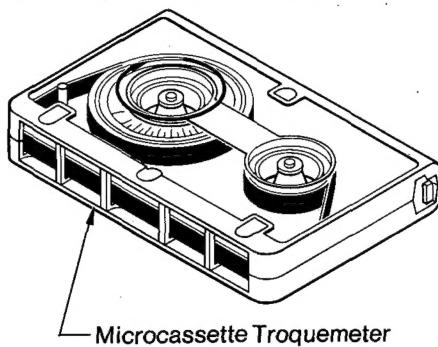


- If necessary, check the following parts.
 - Drive Belt
 - Flywheel
 - Take-up Idler
 - Take-up Reel
- If the above described parts are stained or the rubber is deteriorated, wipe them with a soft cloth soaked in alcohol or replace them with new ones.

FAST FORWARD TORQUE

- Insert the microcassette torquemeter into the cassette compartment and measure the F.FWD. torque with the unit in the fast forward mode. It should be more than 10g-cm.

F.FWD. Torque: more than 10g-cm

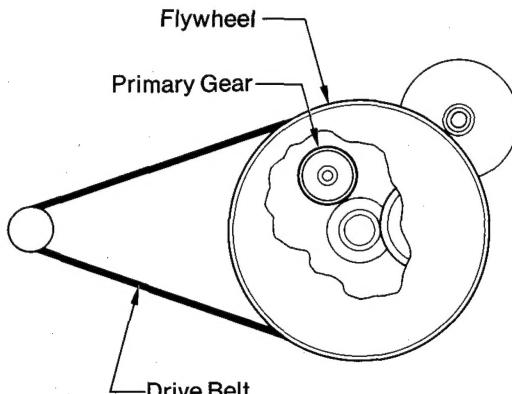


Microcassette Torquemeter

- If necessary, check the following parts.

- Drive Belt
- Flywheel
- Primary Gear

- If the above described parts are stained or the rubber is deteriorated, wipe them with a soft cloth soaked in alcohol or replace them with new ones.

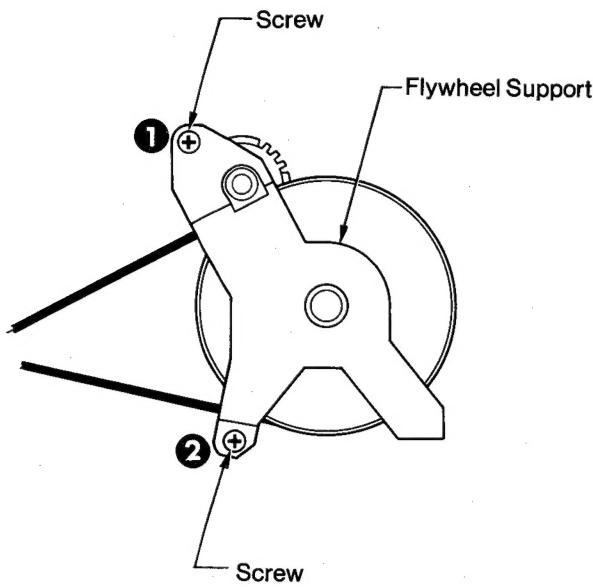


MECHANICAL ADJUSTMENTS (Continued)

FLYWHEEL SUPPORT ADJUSTMENT

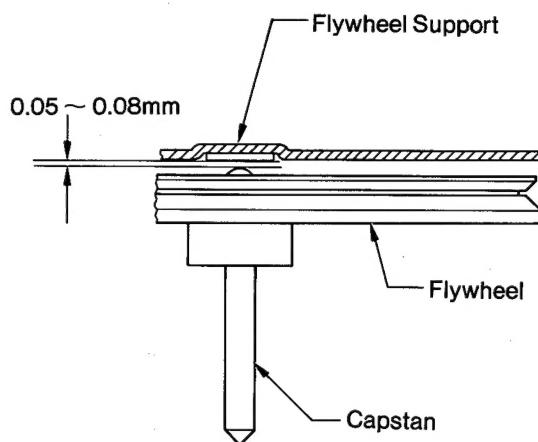
NOTE:

Remove the screws fastening the Flywheel Support in numerical order as illustrated and tighten the screws in reverse order.



The clearance between the Flywheel and the Flywheel Support should be $0.05 \sim 0.08\text{mm}$ with the Chassis turned over as illustrated.

If necessary, adjust the clearance by the following procedures.



1. Apply paint or glue to the threads of the adjusting screw and then, tighten the screw all the way.
2. Turn the screw 1 to 1-1/2 revolution counter-clockwise from the above position. Then, check to see that there is a clearance between the Flywheel and the Flywheel Support by slowly moving the Capstan up and down.
3. After the adjustment, secure the screws fastening the Flywheel Support and the adjusting screw with paint or glue.

ELECTRICAL ADJUSTMENTS

EQUIPMENT REQUIRED

- VTVM (2 sets)
- Dualtrace Synchroscope
- Frequency Counter
- DC Constant-voltage Regulator
- Dummy Load (33Ω)
- Test Tapes
 - * 3kHz Test Tape (Example: OLYMPUS OA-W211) for Tape Speed Adjustment
 - * 5kHz Test Tape (Example: OLYMPUS OA-A221) for Head Azimuth Adjustment
- Alignment Tool

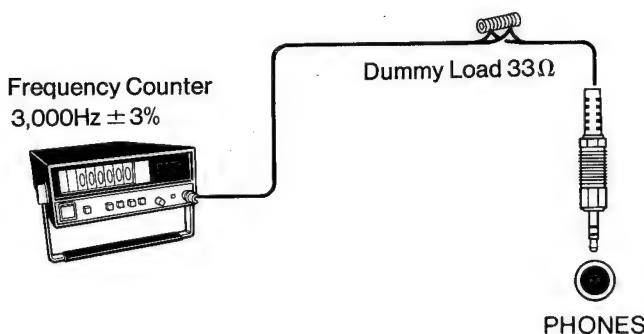
NOTE:

1. Supply 3.0V DC from the constant-voltage regulator at the adjustment.
2. Unless especially specified, set the Tape Speed Switch to "2.4cm".
3. Set the Tape Select Switch to "NORM".

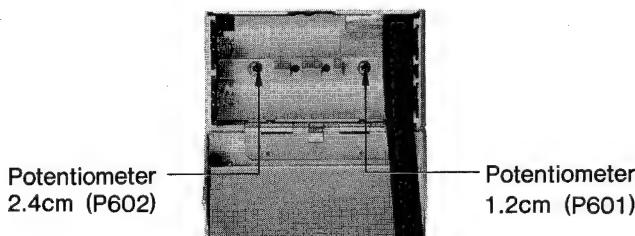
TAPE SPEED ADJUSTMENT

2.4cm/second adjustment

1. Set the Tape Speed Switch to "2.4cm" and open the battery compartment lid.
2. Connect the frequency counter to the headphone jack as illustrated and insert the 3kHz test tape (Example: OLYMPUS OA-W211) into the cassette compartment.



3. While playing back the test tape, adjust the tape speed by turning the potentiometer (P602) in the Governor P.C.Board until the frequency counter reads 3,000Hz ± 3%.



1.2cm/second adjustment

4. Set the Tape Speed Switch to "1.2cm" and play back the test tape with the above described method.
5. Turn the potentiometer (P601) in the Governor P.C.Board until the frequency counter reads 1,500Hz ± 10%.

HEAD AZIMUTH ADJUSTMENT

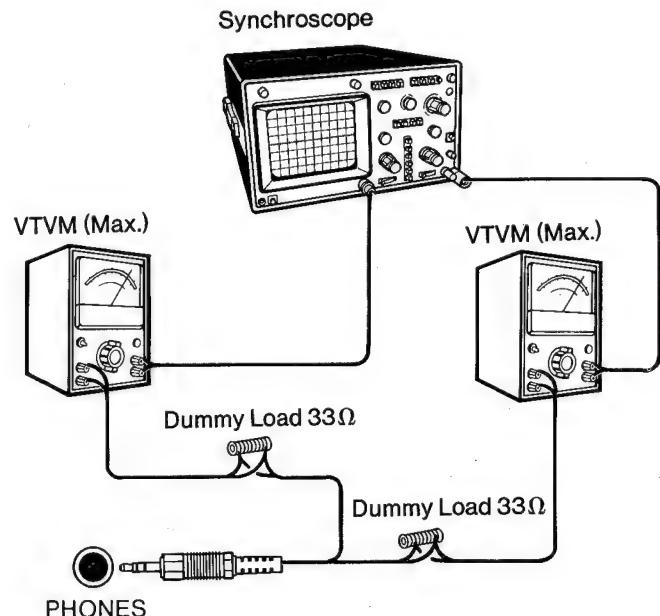
1. Connect the VTVM (2 sets) and the dualtrace synchroscope to the headphone jack as illustrated.

Then, set the synchroscope as follows:

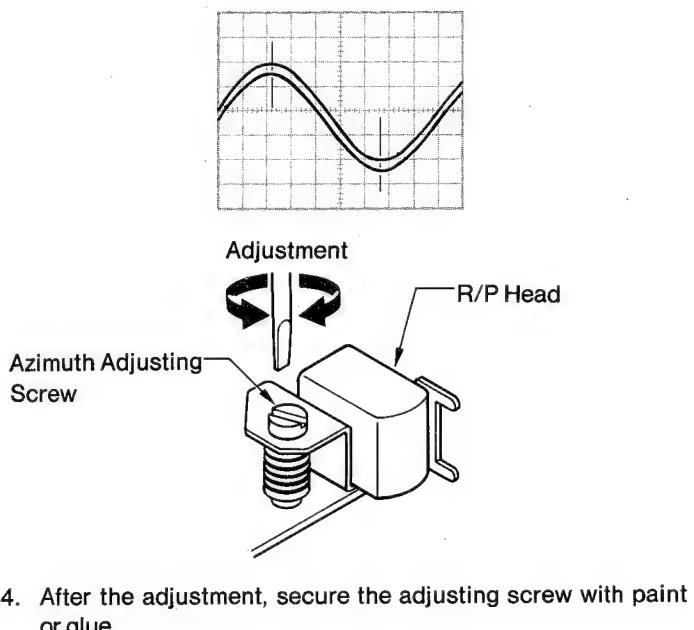
- * MODE CHOP (chopped)
- * SOURCE INT (internal), CH1 or CH2
- * SWEEP MODE AUTO (automatic)

NOTE:

Adjust the field on the synchroscope with the VOLT. ADJ. and TIME ADJ.



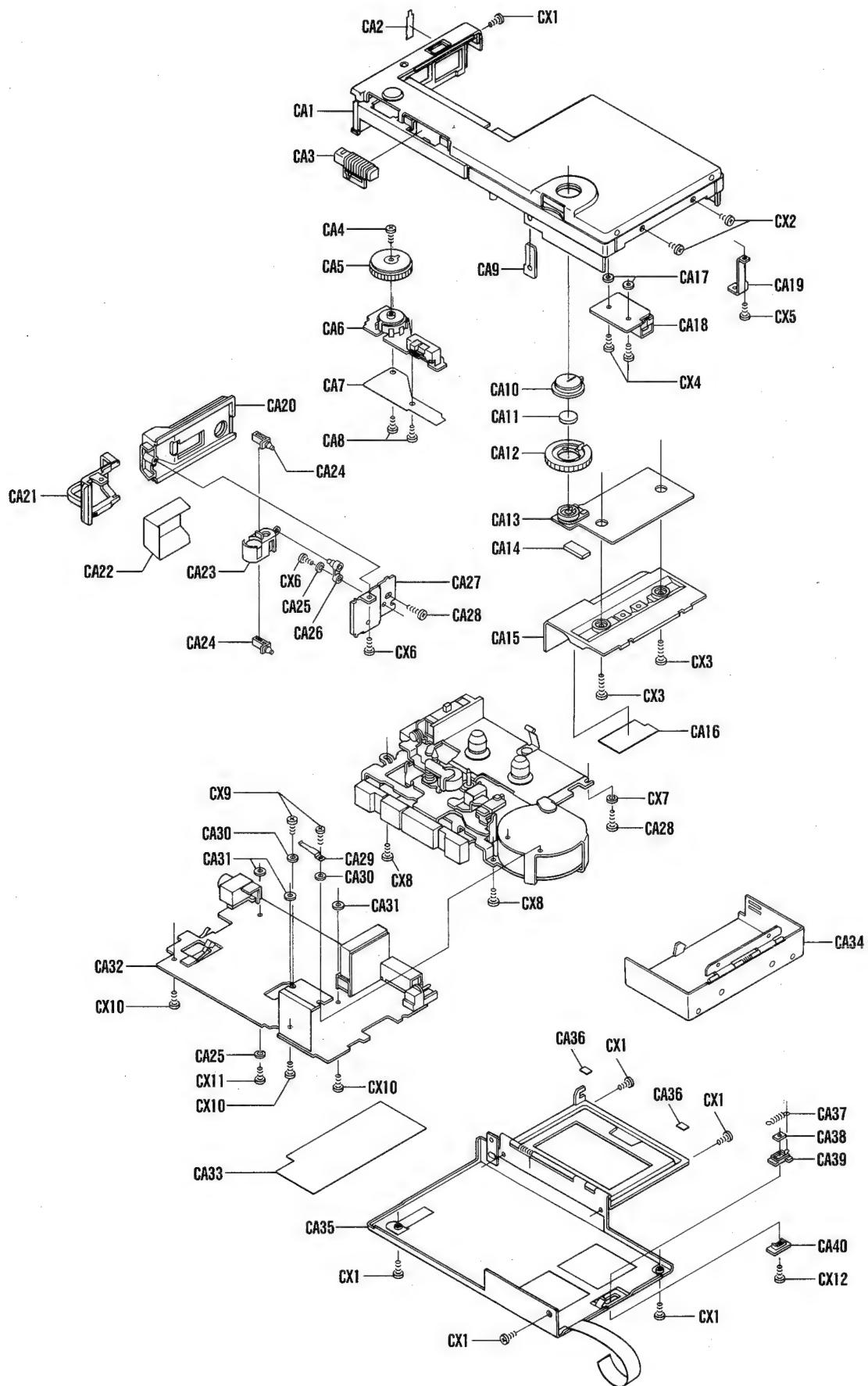
2. Insert a 5kHz test tape (Example: OLYMPUS OA-A221) into the cassette compartment.
3. While playing back the test tape, slowly turn the azimuth adjusting screw until the wave forms of the right and left channels are superimposed and set to optimum at maximum reading of the VTVM.



PARTS LIST

Ref. No.	Parts No.	Description	Q'ty	Ref. No.	Parts No.	Description	Q'ty
		PACKAGE					
141 6 1419 60802		Individual Carton	1	CA42	141 2 2899 14000	Adhesive Sheet	3
141 6 1449 78700		Styrofoam Case	1	CA43	141 2 2899 21600	Adhesive Sheet	2
141 6 2519 17023		Poly Cover 170 x 230	1	CA44	141 2 2899 23500	Adhesive Sheet	2
141 6 3919 40800		Pad	1	CA45	141 2 2899 23700	Adhesive Sheet	4
141 6 4559 03200		Serial No. Sheet	3	CA46	141 2 2899 23800	Adhesive Sheet	1
141 6 2519 12090		Poly Cover	2	CX1	127 3 1314 01614	PI Screw-1, Pan Hd.	+M1.4x1.6
141 6 2519 06010		Poly Cover 60 x 100	2	CX2	128 3 1314 01613	PI Screw-3, Pan Hd.	+M1.4x1.6
				CX3	128 3 1317 05013	PI Screw-3, Pan Hd.	+M1.7x5.0
				CX4	127 3 1317 02013	PI Screw-1, Pan Hd.	+M1.7x2.0
				CX5	127 3 1314 02513	PI Screw-1, Pan Hd.	+M1.4x2.5
				CX6	127 3 1314 03013	PI Screw-1, Pan Hd.	+M1.4x3.0
				CX7	110 3 2101 70013	Spring Washer-2	M1.7
				CX8	128 3 1317 03013	PI Screw-3, Pan Hd.	+M1.7x3.0
				CX9	128 3 1314 02013	PI Screw-3, Pan Hd.	+M1.4x2.0
				CX10	127 3 1314 02013	PI Screw-1, Pan Hd.	+M1.4x2.0
				CX11	128 3 1314 02513	PI Screw-3, Pan Hd.	+M1.4x2.5
				CX12	127 3 1214 02513	PI Screw-1, Flat Hd.	+M1.4x2.5
							1
						NOTES:	
						1. Parts order must contain Model Number, Part Number and Description.	
						2. Ordering quantity of screws and resistors must be multiple of 10 pcs.	
		CABINET					
CA1	141 0 1119 82102	Completed, Cabinet {D3 (LED, SLP-102B Record/Battery) is included.}	1				
CA2	141 2 2449 43600	Sheet	1				
CA3	141 2 1619 63101	Pause Button	1				
CA4	141 2 4219 24200	Screw, Pan Hd.	+M1.4x3.0				
CA5	141 0 1639 08201	Volume Knob Assy	1				
CA6	4 2269 36260	Volume Control P.C.B. Assy [See PCB4]	1				
CA7	141 2 4359 27200	Insulator, Volume PCB	1				
CA8	141 2 4219 23600	Screw, Pan Hd.	+M1.7x4.0				
CA9	141 2 2149 16600	Bracket, Cabinet	1				
CA10	141 2 1459 11200	Pointer, Balance Control	1				
CA11	141 2 4469 40000	Cushion	1				
CA12	141 2 1639 45800	Knob, Balance	1				
CA13	4 2869 70640	Motor Governor P.C.B. Assy [See PCB2]	1				
CA14	141 2 4469 38500	Cushion	1				
CA15	141 2 1149 26900	Battery Compartment	1				
CA16	141 6 4799 24300	Battery Label	1				
CA17	141 2 4579 03800	Washer	2				
CA18	4 2269 36280	Speed Switch P.C.B. Assy [See PCB3]	1				
CA19	141 2 2149 16500	Bracket, Cabinet	1				
CA20	141 0 1219 05300	Mike Cabinet Assy	1				
CA21	141 2 1219 20900	Cap, Mike	1				
CA22	141 2 1519 32000	Grille, Mike	1				
CA23	4 1539 70730	Microphone Assy [BM1 & BM2 are included]	1				
CA24	141 2 3899 11800	Cushion, Mike	2				
CA25	141 2 4569 07000	Spring Washer	2				
CA26	141 2 3899 11700	Cushion, Mike	1				
CA27	141 2 3889 01100	Support, Mike	1				
CA28	141 2 4219 18500	Micro Cassette Screw	2				
CA29	141 2 8539 36400	PCB Plate	1				
CA30	141 2 4539 22000	Washer	2				
CA31	141 2 4539 19300	Washer	3				
CA32	4 1329 77480	Amplifier P.C.B. Assy [See PCB1]	1				
CA33	141 2 4359 30500	Insulator	1				
CA34	141 0 1339 10200	Battery Lid Assy	1				
CA35	141 0 1119 82003	Completed Cabinet Bottom	1				
CA36	141 2 2449 32200	Sheet	2				
CA37	141 2 8549 13300	Spring	1				
CA38	141 2 4179 05200	Nut	1				
CA39	141 2 2529 04100	Battery Lid Lock Plate	1				
CA40	141 2 1619 98300	Battery Lid Lock Button	1				
CA41	141 2 2899 13900	Adhesive Sheet	4				

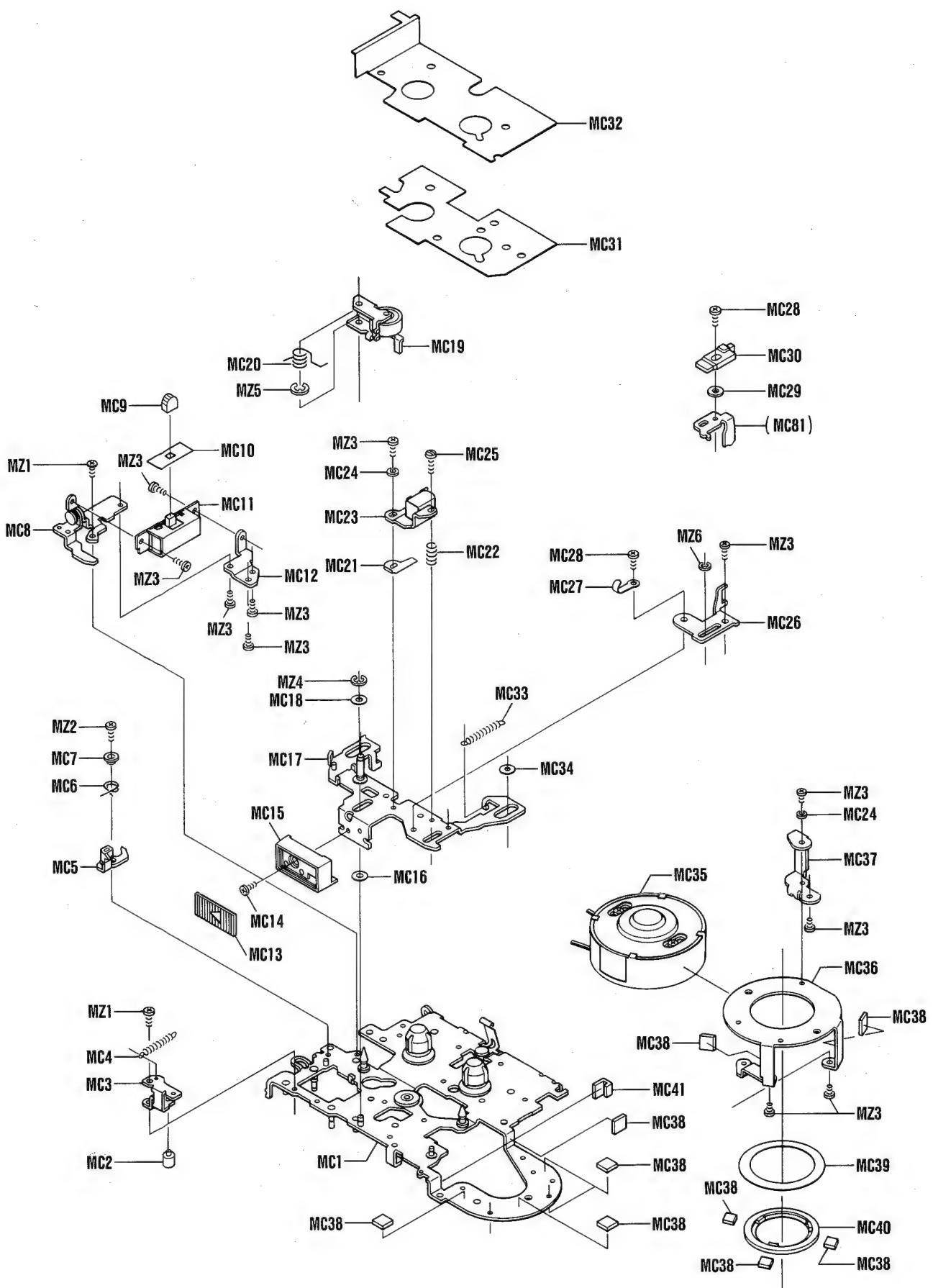
CABINET EXPLODED VIEW



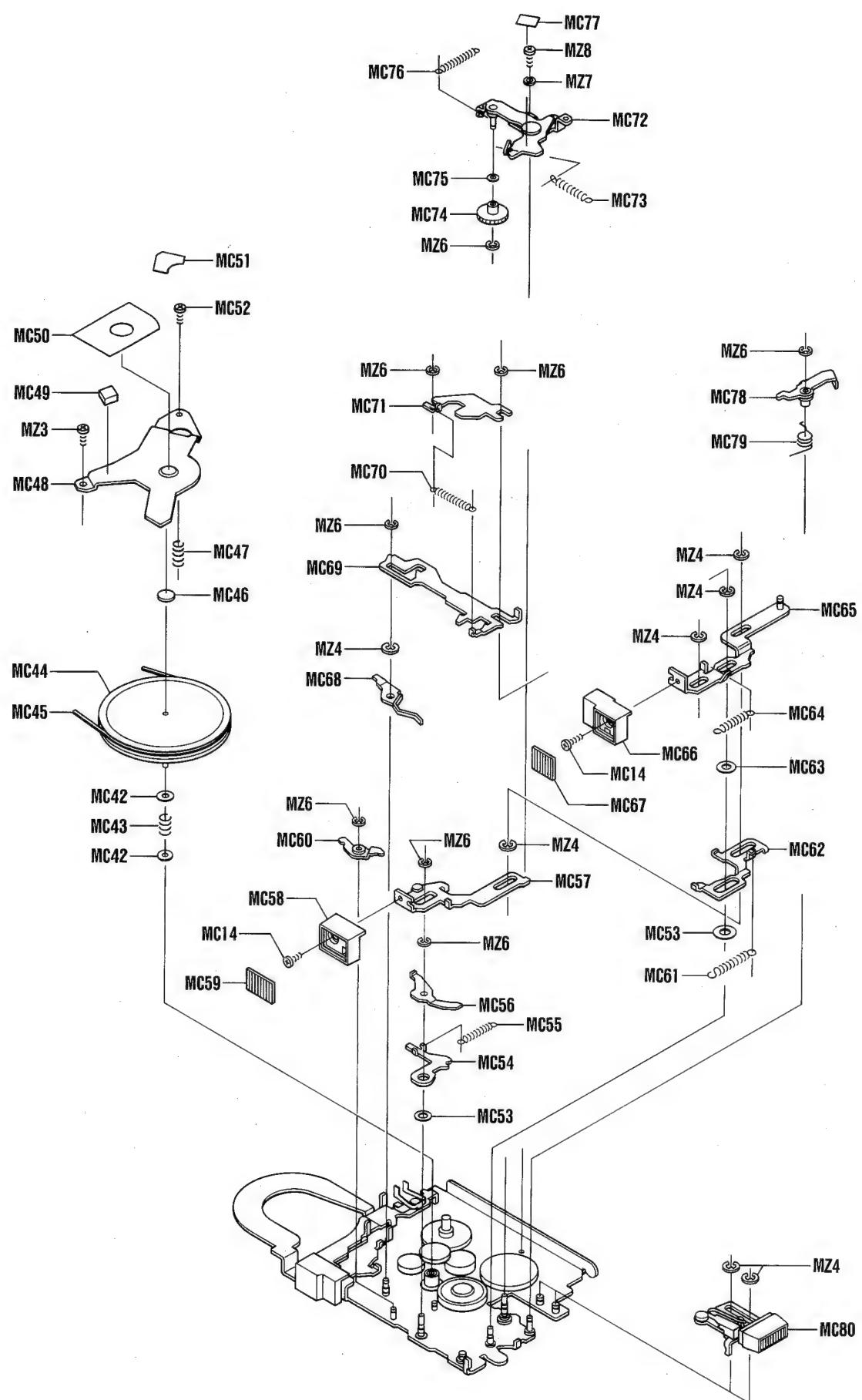
MECHANISM PARTS LIST

Ref. No.	Parts No.	Description	Q'ty	Ref. No.	Parts No.	Description	Q'ty
MECHANISM							
MC1	141 0 3119 17805	Completed Chassis	1	MC64	141 2 8519 84100	Spring, FF Lever	1
MC2	141 2 4539 27400	Spacer	1	MC65	141 0 7419 23500	FF Lever Assy	1
MC3	141 2 3169 18900	Bracket, PCB	1	MC66	141 2 1619 63002	FF Button	1
MC4	141 2 8519 84700	Spring, Slide Base	1	MC67	141 2 1619 63201	Cap, Button	2
MC5	141 0 7319 23600	Lid Lock Plate Assy	1	MC68	141 2 7439 17100	Record Remove Arm	1
MC6	141 2 8519 82500	Spring, Lid Lock	1	MC69	141 2 7319 38800	Lock Plate	1
MC7	141 2 7529 81400	Post, Lid Lock	1	MC70	141 2 8519 83700	Spring, Lock Plate	1
MC8	141 0 8139 01100	Eject Bracket Assy	1	MC71	141 2 7319 38600	Interlock, FF/REC	1
MC9	141 2 1649 17000	Metal Switch Button	1	MC72	141 0 3169 08000	FF ACT Bracket Assy	1
MC10	141 2 2419 26200	Sheet, Switch	1	MC73	141 2 8519 85500	Spring, FF Actuate	1
MC11	4 2269 36240	Tape Select Switch P.C.B. Assy [See PCB5]	1	MC74	141 2 5519 31700	FF Idle Gear	1
MC12	141 2 8139 08200	Bracket	1	MC75	141 2 4539 18200	Washer	2
MC13	141 2 1619 63401	Cap, Play Button	1	MC76	141 2 8519 83500	Spring, FF Actuate	1
MC14	141 2 4219 10500	Screw, Pan Hd.	+M1.7x3.0	MC77	141 2 2449 43400	Sheet	1
MC15	141 2 1619 62902	Play Button	1	MC78	141 0 7319 19800	Stop Link Plate Assy	1
MC16	141 2 4539 09400	Washer	1	MC79	141 2 8519 84500	Spring, Stop Link	1
MC17	141 0 7419 23302	Slide Base Assy	1	MC80	141 0 7419 23604	Stop Lever Assy	1
MC18	141 2 4539 08000	Washer	2	MC81	141 2 7319 38700	Erase Head Lever	1
MC19	141 0 5419 02700	Pinch Roller Assy	1	MC82	141 2 8519 84000	Spring, Rewind Lever	1
MC20	141 2 8519 84600	Spring, Pinch Roller	1	MC83	141 0 7419 23400	Riwind Lever Assy	1
MC21	141 2 3769 13300	Spacer, Head	1	MC84	141 2 1619 62702	Rewind Button	1
MC22	141 2 8519 82900	Spring, Azimuth	1	MC85	141 2 8519 83000	Spring, Rewind	1
MC23	4 2429 72040	R/P Head [HD1]	1	MC86	141 0 8429 01302	Record Actuator Assy	1
MC24	141 2 4569 07000	Spring Washer	3	MC87	141 2 8519 83800	Spring Quick Erase	1
MC25	141 2 4219 21500	Screw	1	MC88	141 2 8519 84900	Spring, Record Actuate	1
MC26	141 2 7319 51700	Tape Guide	1	MC89	141 2 8519 84200	Spring, Interlock	1
MC27	141 2 4729 06500	Lug	1	MC90	141 2 4579 03900	Washer	1
MC28	141 2 4219 15401	Screw	+M1.7x2.0	MC91	141 2 7439 17000	Interlock, Rewind	1
MC29	141 2 4539 20900	Washer	1	MC92	141 2 8519 82700	Spring, Rewind Interlock	1
MC30	4 2429 72050	Erase Head [HD2]	1	MC93	141 2 4539 17500	Washer	2
MC31	141 2 2899 12800	Adhesive Sheet	1	MC94	141 2 7439 16800	Record Actuate Arm	1
MC32	141 2 1219 13501	Chassis Panel	1	MC95	141 2 3529 23300	Spacer, REC ACT Arm	1
MC33	141 2 8519 84800	Spring, Base	1	MC96	141 2 8519 87700	Spring, Record Arm	1
MC34	141 2 4539 20400	Washer	1	MC97	141 2 4579 03800	Washer	1
MC35	4 5279 70981	Motor [M1]	1	MC98	141 0 7439 07700	Review Arm Assy	1
MC36	141 2 3789 08100	Motor Bracket	1	MC99	141 2 8519 82300	Spring, Review	1
MC37	141 2 3789 08200	Motor Bracket	1	MC100	141 2 7439 16900	Interlock	1
MC38	141 2 4459 23000	Cushion	9	MC101	141 2 3529 25800	Spacer Interlock	1
MC39	141 2 2899 12600	Adhesive Sheet	1	MC102	141 2 3529 23900	Spacer, Rewind Gear	1
MC40	141 2 4459 22900	Cushion, Motor Top	1	MC103	141 0 7439 07500	Line Gear Arm Assy	1
MC41	141 2 4459 23900	Cushion, Motor Side	1	MC104	141 2 8519 83600	Spring Line Gear	1
MC42	141 2 4539 13001	Washer	2	MC105	141 2 5519 32000	Primary Gear	1
MC43	141 2 8559 00700	Spring, Thrust	1	MC106	141 2 4539 18301	Washer	1
MC44	141 0 5219 06203	Flywheel Assy	1	MC107	141 2 5519 31800	Rewind Idle Gear	1
MC45	141 2 5649 18200	Belt, Flywheel	1	MC108	141 2 5529 13000	Rewind Gear Pin	1
MC46	141 2 4539 17900	Bearing, Flywheel Thrust	1	MC109	141 2 5519 31900	Secondary Gear	1
MC47	141 2 8519 84300	Spring, Flywheel Support	1	MC110	141 2 5529 12900	Spacer Secondary Gear	1
MC48	141 2 3169 13001	Support Flywheel	1	MC111	141 2 7319 39000	FF ACT Lever	1
MC49	141 2 4459 28800	Cushion	1	MC112	141 2 3529 23800	Spacer, FF ACT	2
MC50	141 2 4359 31200	Insulator	1	MC113	141 0 5559 05500	Idler Arm Assy	1
MC51	141 2 2449 35300	Sheet	1	MC114	141 2 4539 14900	Washer	1
MC52	141 2 4219 27700	Screw, Pan Hd.	+M1.4x2.5	MC115	141 2 5519 31600	Take-up Idler	1
MC53	141 2 4539 19700	Washer	2	MC116	141 2 3529 23500	Spacer, Idler Arm	1
MC54	141 2 7439 17200	Record Lock Arm	1	MC117	141 2 8519 82600	Spring, Idler Arm	1
MC55	141 2 8519 82400	Spring, REC Arm Lock	1	MZ1	127 3 1214 02013	PI Screw-1, Flat Hd.	+M1.4x2.0
MC56	141 2 7439 16700	Eject Actuate Arm	1	MZ2	127 3 1214 02513	PI Screw-1, Flat Hd.	+M1.4x2.5
MC57	141 0 8419 03800	Record Lever Assy	1	MZ3	127 3 1314 01613	PI Screw-1, Pan Hd.	+M1.4x1.6
MC58	141 2 1619 62802	Record Button	1	MZ4	112 3 1301 50082	E Ring	M1.5
MC59	141 2 1619 63301	Cap, Record Button	1	MZ5	112 3 1302 00082	E Ring	M2.0
MC60	141 0 7439 07400	Record Link Arm Assy	1	MZ6	112 3 1301 20082	E Ring	M1.2
MC61	141 2 8549 14400	Spring	1	MZ7	110 3 2101 70013	Spring Washer-2	M1.7
MC62	141 2 7319 51600	Eject ACT Lever	1	MZ8	127 3 1317 02313	PI Screw-1, Pan Hd.	+M1.7x2.3
MC63	141 2 4539 19800	Washer	1	MZ9	127 3 1314 04013	PI Screw-1, Pan Hd.	+M1.4x4.0
				MZ10	127 3 1314 03013	PI Screw-1, Pan Hd.	+M1.4x3.0
				MZ11	127 3 1314 02013	PI Screw-1, Pan Hd.	+M1.4x2.0

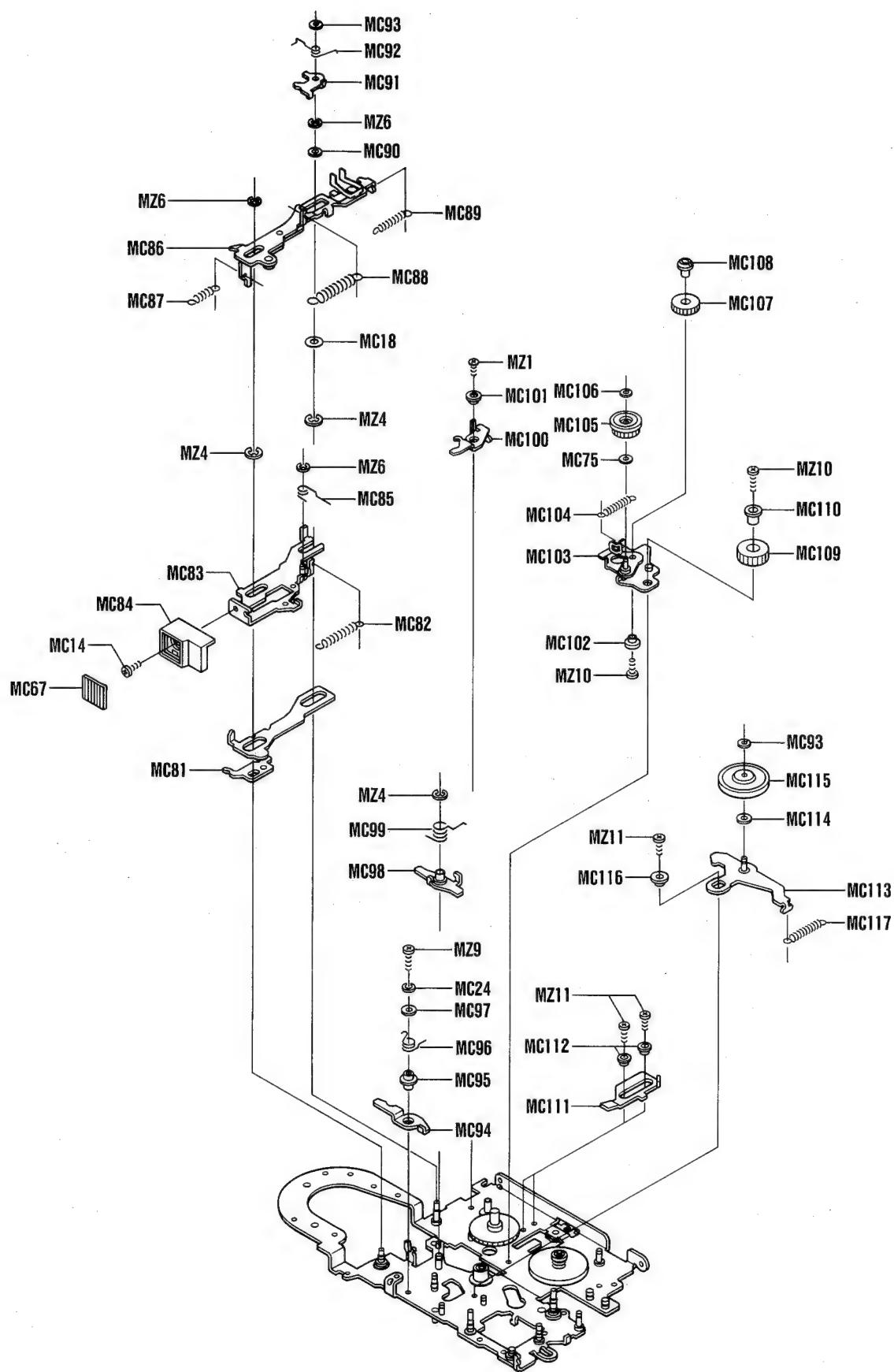
MECHANISM EXPLODED VIEW



MECHANISM EXPLODED VIEW (Continued)



MECHANISM EXPLODED VIEW (Continued)



P.C.BOARD PARTS LIST

Ref. No.	Parts No.	Description	Q'ty	Ref. No.	Parts No.	Description	Q'ty
	AMPLIFIER P.C.B. ASSY						
PCB1	4 1329 77480	Amplifier P.C.B. Assy	1	C111	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1
	141 2 3769 12900	Spacer	1	C112	CG1 5 2500 KH00A	Chip	0.0015 μ F 50V $\pm 10\%$ 1
	141 2 4219 18200	Eyelet	1	C113	CT1 0 4350 M00TV	Tantalume	0.1 μ F 35V $\pm 20\%$ 1
	4 2269 36220	Mike Jack P.C.B. Assy [See PCB6]	1	C114	CD4 7 640A 0002V	Electrolytic	47 μ F 4V 1
	141 2 4359 30600	Insulator	1	C115	CG2 2 3250 MH00B	Chip	0.022 μ F 25V $\pm 20\%$ 1
	141 2 4359 30800	Insulator	1	C116	CT1 5 4350 M00TV	Tantalume	0.15 μ F 35V $\pm 20\%$ 1
	141 2 2899 23300	Adhesive Sheet	2	C117	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1
	141 2 2899 13900	Adhesive Sheet	1	C118	CG4 7 2500 KH00A	Chip	0.0047 μ F 50V $\pm 10\%$ 1
S1	4 2319 75210	Slide Switch (Record/Play)	1	C119	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1
S2	4 2319 73630	Slide Switch (Tone)	1	C120	CT1 0 4350 M00TV	Tantalume	0.1 μ F 35V $\pm 20\%$ 1
S3	4 2319 73720	Detector Switch	1	C121	CD4 7 640A 0002V	Electrolytic	47 μ F 4V 1
S4	4 2319 73610	Leaf Switch (Power)	1	C122	CD4 7 640A 0002V	Electrolytic	47 μ F 4V 1
S5	141 2 8539 34800	Leaf Plate (FF/REW Switch)	1	C123	CD2 2 663A 0002V	Electrolytic	22 μ F 6.3V 1
J2	4 2359 75260	1P Jack (Headphones)	1	C124	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1
J3	4 2359 74320	Ext. Power Jack	1	C125	CT4 7 630A M00FV	Tantalume	47 μ F 3V $\pm 20\%$ 1
T1	4 2589 71900	OSC Trans	1	C126	CG6 8 1500 KH00A	Chip	680pF 50V $\pm 10\%$ 1
T2	4 2589 71900	OSC Trans	1	C127	CT1 0 5250 M00NV	Tantalume	1 μ F 25V $\pm 20\%$ 1
D1	4 2029 71320	Diode, MA151WK	1	C128	CD2 2 740A 0002V	Electrolytic	220 μ F 4V 1
D2	4 2029 71320	Diode, MA151WK	1	C129	CG2 2 2500 KD00A	Chip	0.0022 μ F 50V $\pm 10\%$ 1
D4	4 2029 71360	Diode, MA151WA	1	C131	CG2 7 3250 MH00A	Chip	0.027 μ F 25V $\pm 20\%$ 1
Q1	203 5 5210 53660	Transistor, 2SC 536	1	C132	CG1 0 1500 JD00A	Chip	100pF 50V $\pm 5\%$ 1
Q2	4 2039 70800	Transistor, 2SB 738	1	C135	4 2239 70690	Chip	2.2 μ F 6.3V 1
Q3	4 2039 70720	Transistor, 2SD 601	1	C136	CG1 0 2500 KH00B	Chip	0.001 μ F 50V $\pm 10\%$ 1
Q4	4 2039 70720	Transistor, 2SD 601	1	C137	CG1 0 2500 KH00B	Chip	0.001 μ F 50V $\pm 10\%$ 1
Q11	4 2039 70720	Transistor, 2SD 601	1	C203	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1
Q12	4 2039 70720	Transistor, 2SD 601	1	C204	CT1 0 630A M00FV	Tantalume	10 μ F 3V $\pm 20\%$ 1
Q13	4 2039 70720	Transistor, 2SD 601	1	C205	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1
Q14	4 2039 70720	Transistor, 2SD 601	1	C206	CT2 2 630A M00FV	Tantalume	22 μ F 3V $\pm 20\%$ 1
Q15	4 2039 70720	Transistor, 2SD 601	1	C207	CG3 3 2500 KH00A	Chip	0.0033 μ F 50V $\pm 10\%$ 1
Q21	4 2039 70720	Transistor, 2SD 601	1	C208	CD1 0 6160 0002V	Electrolytic	10 μ F 16V 1
Q22	4 2039 70720	Transistor, 2SD 601	1	C209	CG3 9 3250 MH00A	Chip	0.039 μ F 25V $\pm 20\%$ 1
Q23	4 2039 70720	Transistor, 2SD 601	1	C210	CT1 0 4350 M00TV	Tantalume	0.1 μ F 35V $\pm 20\%$ 1
Q24	4 2039 70720	Transistor, 2SD 601	1	C211	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1
Q25	4 2039 70720	Transistor, 2SD 601	1	C212	CG1 5 2500 KH00A	Chip	0.0015 μ F 50V $\pm 10\%$ 1
IC1	4 2069 71450	IC, μ PC1217G	1	C213	CT1 0 4350 M00SV	Tantalume	0.1 μ F 35V $\pm 20\%$ 1
IC2	4 2069 71450	IC, μ PC1217G	1	C214	CD4 7 640A 0002V	Electrolytic	47 μ F 4V 1
IC3	4 2069 71480	IC, TK-10360	1	C215	CG2 2 3250 MH00A	Chip	0.022 μ F 25V $\pm 20\%$ 1
IC4	4 2069 71470	IC, SA-109B	1	C216	CT1 5 4350 M00TV	Tantalume	0.15 μ F 35V $\pm 20\%$ 1
C1	CG1 5 2500 KH00A	Chip	0.0015 μ F 50V $\pm 10\%$ 1	C217	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1
C2	CG2 2 2500 KH00A	Chip	0.0022 μ F 50V $\pm 10\%$ 1	C218	CG4 7 2500 KH00A	Chip	0.0047 μ F 50V $\pm 10\%$ 1
C3	CT3 3 630A M00HV	Tantalume	33 μ F 3V $\pm 20\%$ 1	C219	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1
C4	CD2 2 740A 0002V	Electrolytic	220 μ F 4V 1	C220	CT1 0 4350 M00TV	Tantalume	0.1 μ F 35V $\pm 20\%$ 1
C5	CD2 2 740A 0002V	Electrolytic	220 μ F 4V 1	C221	CT4 7 630A M00FV	Tantalume	47 μ F 3V $\pm 20\%$ 1
C6	CT2 2 630A M00FV	Tantalume	22 μ F 3V $\pm 20\%$ 1	C222	CT4 7 630A M00FV	Tantalume	47 μ F 3V $\pm 20\%$ 1
C7	CD4 7 640A 0002V	Electrolytic	47 μ F 4V 1	C223	CT2 2 630A M00FV	Tantalume	22 μ F 3V $\pm 20\%$ 1
C8	CT2 2 630A M00FV	Tantalume	22 μ F 3V $\pm 20\%$ 1	C224	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1
C9	CT4 7 630A M00HV	Tantalume	47 μ F 3V $\pm 20\%$ 1	C225	CD4 7 640A 0002V	Electrolytic	47 μ F 4V 1
C10	CD2 2 740A 0002V	Electrolytic	220 μ F 4V 1	C226	CG6 8 1500 KH00A	Chip	680pF 50V $\pm 10\%$ 1
C11	CD2 2 740A 0002V	Electrolytic	220 μ F 4V 1	C227	CT1 0 5250 M00NV	Tantalume	1 μ F 25V $\pm 20\%$ 1
C12	CT1 0 630A M00FV	Tantalume	10 μ F 3V $\pm 20\%$ 1	C228	CT1 0 730A M00HV	Tantalume	100 μ F 3V $\pm 20\%$ 1
C13	CT1 0 630A M00FV	Tantalume	10 μ F 3V $\pm 20\%$ 1	C229	CG2 2 2500 KD00A	Chip	0.0022 μ F 50V $\pm 10\%$ 1
C14	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1	C230	CT1 0 730A M00HV	Tantalume	100 μ F 3V $\pm 20\%$ 1
C15	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1	C231	CG2 7 3250 MH00A	Chip	0.027 μ F 25V $\pm 20\%$ 1
C17	CT4 7 630A M00FV	Tantalume	47 μ F 3V $\pm 20\%$ 1	C232	CG1 0 1500 JD00A	Chip	100pF 50V $\pm 5\%$ 1
C18	CG1 0 2500 KH00B	Chip	0.001 μ F 50V $\pm 10\%$ 1	C235	4 2239 70690	Chip	2.2 μ F 6.3V 1
C103	CT1 0 5250 M00NV	Tantalume	1 μ F 25V $\pm 20\%$ 1	C236	CG1 0 2500 KH00B	Chip	0.001 μ F 50V $\pm 10\%$ 1
C104	CD1 0 6160 0002V	Electrolytic	10 μ F 16V 1	C237	CG1 0 2500 KH00B	Chip	0.001 μ F 50V $\pm 10\%$ 1
C105	CT1 0 5100 M00TV	Tantalume	1 μ F 10V $\pm 20\%$ 1	R1	RG1 5 3121 JA000	Chip	15k Ω 1/8W $\pm 5\%$ 1
C106	CD2 2 663A 0002V	Electrolytic	22 μ F 6.3V 1	R2	RG1 5 2121 JA000	Chip	1.5k Ω 1/8W $\pm 5\%$ 1
C107	CG3 3 2500 KH00A	Chip	0.0033 μ F 50V $\pm 10\%$ 1	R4	RG1 8 1121 JA000	Chip	180 Ω 1/8W $\pm 5\%$ 1
C108	CD1 0 6160 0002V	Electrolytic	10 μ F 16V 1	R6	RG1 0 1121 JA000	Chip	100 Ω 1/8W $\pm 5\%$ 1
C109	CG3 9 3250 MH00A	Chip	0.039 μ F 25V $\pm 20\%$ 1	R7	RG1 0 3121 JA000	Chip	10k Ω 1/8W $\pm 5\%$ 1
C110	CT1 0 4350 M00TV	Tantalume	0.1 μ F 35V $\pm 20\%$ 1	R8	RG6 8 2121 JA000	Chip	6.8k Ω 1/8W $\pm 5\%$ 1
C				R10	RG1 0 3121 JA000	Chip	10k Ω 1/8W $\pm 5\%$ 1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Parts No.	Description	Q'ty	Ref. No.	Parts No.	Description	Q'ty		
R11	RG1 2 4121 JA000	Chip	120kΩ 1/8W ± 5%	1	R230	RG6 8 1121 JA000	Chip	680Ω 1/8W ± 5%	1
R12	RG1 5 3121 JA000	Chip	15kΩ 1/8W ± 5%	1	R231	RG5 6 3121 JA000	Chip	56kΩ 1/8W ± 5%	1
R13	RG2 7 2121 JA000	Chip	2.7kΩ 1/8W ± 5%	1	R232	RG1 0 1121 JA000	Chip	100Ω 1/8W ± 5%	1
R14	RG4 7 1121 JA000	Chip	470Ω 1/8W ± 5%	1	R233	RG2 2 A121 KA000	Chip	2.2Ω 1/8W ± 10%	1
R15	RG8 2 2101 JB000	Chip	8.2kΩ 1/10W ± 5%	1	R235	RG2 2 3121 JA000	Chip	22kΩ 1/8W ± 5%	1
R16	RG5 6 1121 JA000	Chip	560Ω 1/8W ± 5%	1					
R17	RG4 7 0121 KA000	Chip	47Ω 1/8W ± 10%	1					
R104	RG4 7 2101 JB000	Chip	4.7kΩ 1/10W ± 5%	1					
R105	RG1 8 2101 JB000	Chip	1.8kΩ 1/10W ± 5%	1					
R106	RG1 8 3121 JA000	Chip	18kΩ 1/8W ± 5%	1					
R107	RG1 0 2101 JB000	Chip	1kΩ 1/10W ± 5%	1					
R108	RG3 3 3121 JA000	Chip	33kΩ 1/8W ± 5%	1					
R109	RG4 7 1121 JA000	Chip	470Ω 1/8W ± 5%	1					
R110	RG1 0 4101 JB000	Chip	100kΩ 1/10W ± 5%	1					
R111	RG2 7 2121 JA000	Chip	2.7kΩ 1/8W ± 5%	1					
R112	RG1 0 3101 JB000	Chip	10kΩ 1/10W ± 5%	1					
R113	RG4 7 3121 JA000	Chip	47kΩ 1/8W ± 5%	1					
R114	RG1 0 2121 JA000	Chip	1kΩ 1/8W ± 5%	1					
R115	RG1 0 3121 JA000	Chip	10kΩ 1/8W ± 5%	1					
R116	RG6 8 2121 JA000	Chip	6.8kΩ 1/8W ± 5%	1					
R117	RG1 8 1121 JA000	Chip	180Ω 1/8W ± 5%	1					
R118	RG1 2 3121 JA000	Chip	12kΩ 1/8W ± 5%	1					
R119	RG1 5 3101 JB000	Chip	15kΩ 1/10W ± 5%	1					
R120	RG4 7 2101 JB000	Chip	4.7kΩ 1/10W ± 5%	1					
R121	RG1 0 3121 JA000	Chip	10kΩ 1/8W ± 5%	1					
R122	RG2 2 4121 JA000	Chip	220kΩ 1/8W ± 5%	1					
R123	RG2 2 5101 JB000	Chip	2.2MΩ 1/10W ± 5%	1					
R124	RG4 7 2121 JA000	Chip	4.7kΩ 1/8W ± 5%	1					
R125	RG1 0 1121 JA000	Chip	100Ω 1/8W ± 5%	1					
R126	RG1 0 3121 JA000	Chip	10kΩ 1/8W ± 5%	1					
R127	RG1 0 3121 JA000	Chip	10kΩ 1/8W ± 5%	1					
R128	RG5 6 0121 KA000	Chip	56Ω 1/8W ± 10%	1					
R129	RG1 0 2121 JA000	Chip	1kΩ 1/8W ± 5%	1					
R130	RG6 8 1121 JA000	Chip	680Ω 1/8W ± 5%	1					
R131	RG5 6 3121 JA000	Chip	56kΩ 1/8W ± 5%	1					
R132	RG1 0 1121 JA000	Chip	100Ω 1/8W ± 5%	1					
R133	RG2 2 A121 KA000	Chip	2.2Ω 1/8W ± 10%	1					
R135	RG2 2 3121 JA000	Chip	22kΩ 1/8W ± 5%	1					
R204	RG4 7 2101 JB000	Chip	4.7kΩ 1/10W ± 5%	1					
R205	RG1 8 2101 JB000	Chip	1.8kΩ 1/10W ± 5%	1					
R206	RG1 8 3121 JA000	Chip	18kΩ 1/8W ± 5%	1					
R207	RG1 0 2121 JA000	Chip	1kΩ 1/8W ± 5%	1					
R208	RG3 3 3101 JB000	Chip	33kΩ 1/10W ± 5%	1					
R209	RG4 7 1121 JA000	Chip	470Ω 1/8W ± 5%	1					
R210	RG1 0 4101 JB000	Chip	100kΩ 1/10W ± 5%	1					
R211	RG2 7 2121 JA000	Chip	2.7kΩ 1/8W ± 5%	1					
R212	RG1 0 3121 JA000	Chip	10kΩ 1/8W ± 5%	1					
R213	RG4 7 3121 JA000	Chip	47kΩ 1/8W ± 5%	1					
R214	RG1 0 2121 JA000	Chip	1kΩ 1/8W ± 5%	1					
R215	RG1 0 3121 JA000	Chip	10kΩ 1/8W ± 5%	1					
R216	RG6 8 2121 JA000	Chip	6.8kΩ 1/8W ± 5%	1					
R217	RG1 8 1121 JA000	Chip	180Ω 1/8W ± 5%	1					
R218	RG1 2 3121 JA000	Chip	12kΩ 1/8W ± 5%	1					
R219	RG1 5 3121 JA000	Chip	15kΩ 1/8W ± 5%	1					
R220	RG4 7 2101 JB000	Chip	4.7kΩ 1/10W ± 5%	1					
R221	RG1 0 3121 JA000	Chip	10kΩ 1/8W ± 5%	1					
R222	RG2 2 4121 JA000	Chip	220kΩ 1/8W ± 5%	1					
R223	RG2 2 5121 JA000	Chip	2.2MΩ 1/8W ± 5%	1					
R224	RG4 7 2121 JA000	Chip	4.7kΩ 1/8W ± 5%	1					
R225	RG1 0 1121 JA000	Chip	100Ω 1/8W ± 5%	1					
R226	RG1 0 3121 JA000	Chip	10kΩ 1/8W ± 5%	1					
R227	RG1 0 3121 JA000	Chip	10kΩ 1/8W ± 5%	1					
R228	RG5 6 0121 KA000	Chip	56Ω 1/8W ± 10%	1					
R229	RG1 0 2121 JA000	Chip	1kΩ 1/8W ± 5%	1					

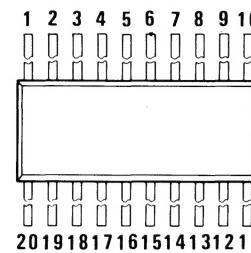
P.C.BOARD PARTS LIST (Continued)

Ref. No.	Parts No.	Description	Q'ty
MIKE JACK P.C.B. ASSY			
PCB6	4 2269 36220	Mike Jack P.C.B. Assy	1
	4 2269 36210	PCB, Mike Jack	1
	141 2 4359 24000	Insulator	1
	141 2 4359 30700	Insulator	1
J1	4 2359 75500	1P Jack (Mike/LINE)	1
C101	CG6 8 3250 MH00C	0.068μF 25V ± 20%	1
C102	CG2 7 3250 MH00A	0.027μF 25V ± 20%	1
C201	CG6 8 3250 MH00C	0.068μF 25V ± 20%	1
C202	CG2 7 3250 MH00A	0.027μF 25V ± 20%	1
R102	RG3 3 2121 JA000	3.3kΩ 1/8W ± 5%	1
R103	RG2 2 0121 KA000	22Ω 1/8W ± 10%	1
R202	RG3 3 2121 JA000	3.3kΩ 1/8W ± 5%	1
R203	RG2 2 0121 KA000	22Ω 1/8W ± 10%	1
NOTES:			
1. Parts order must contain Model Number, Part Number and Description.			
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.			

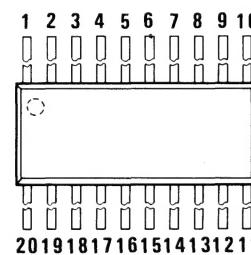
IC & TRANSISTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SC536		
2SD601 2SB709		
2SB738		
2SD847		
TERMINAL NAME		
B → BASE C → COLLECTOR E → Emitter		

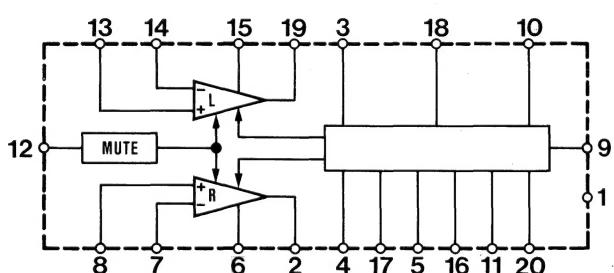
TK1036 BOTTOM VIEW



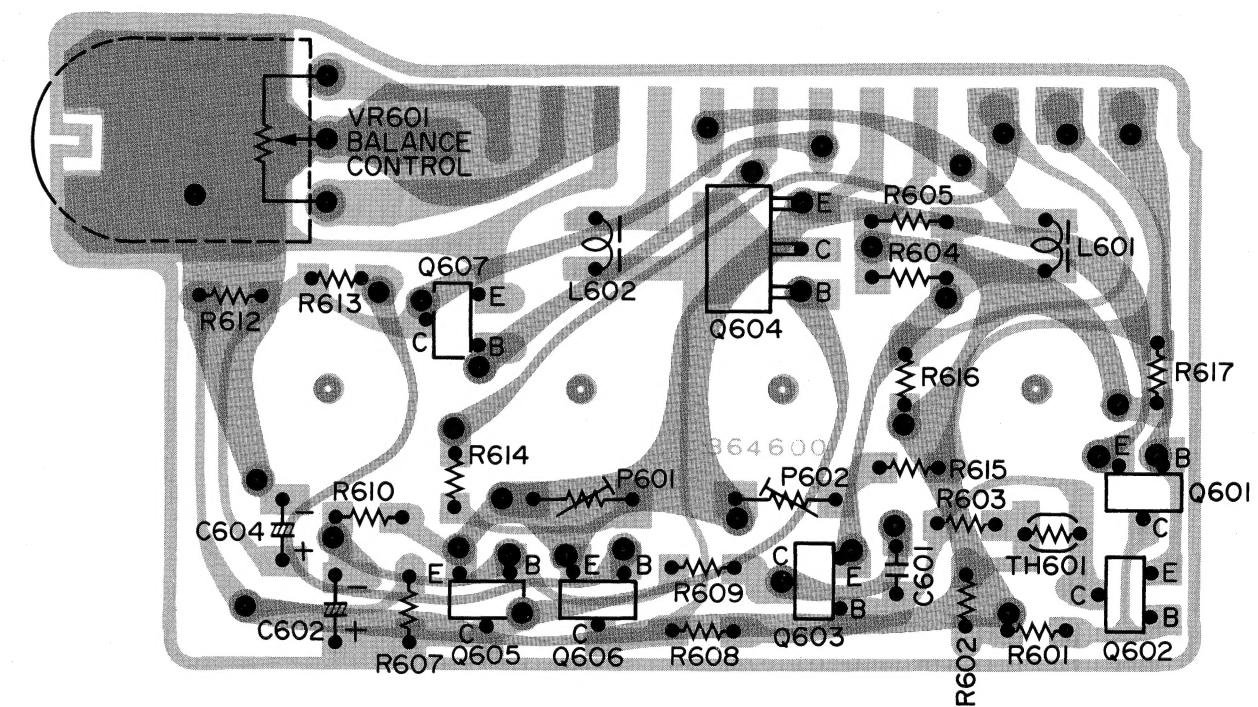
μ PC1217G BOTTOM VIEW



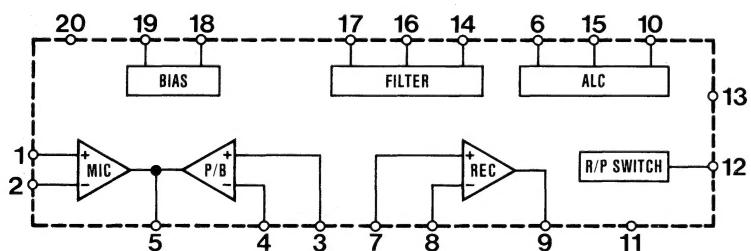
TK1036 BLOCK DIAGRAM



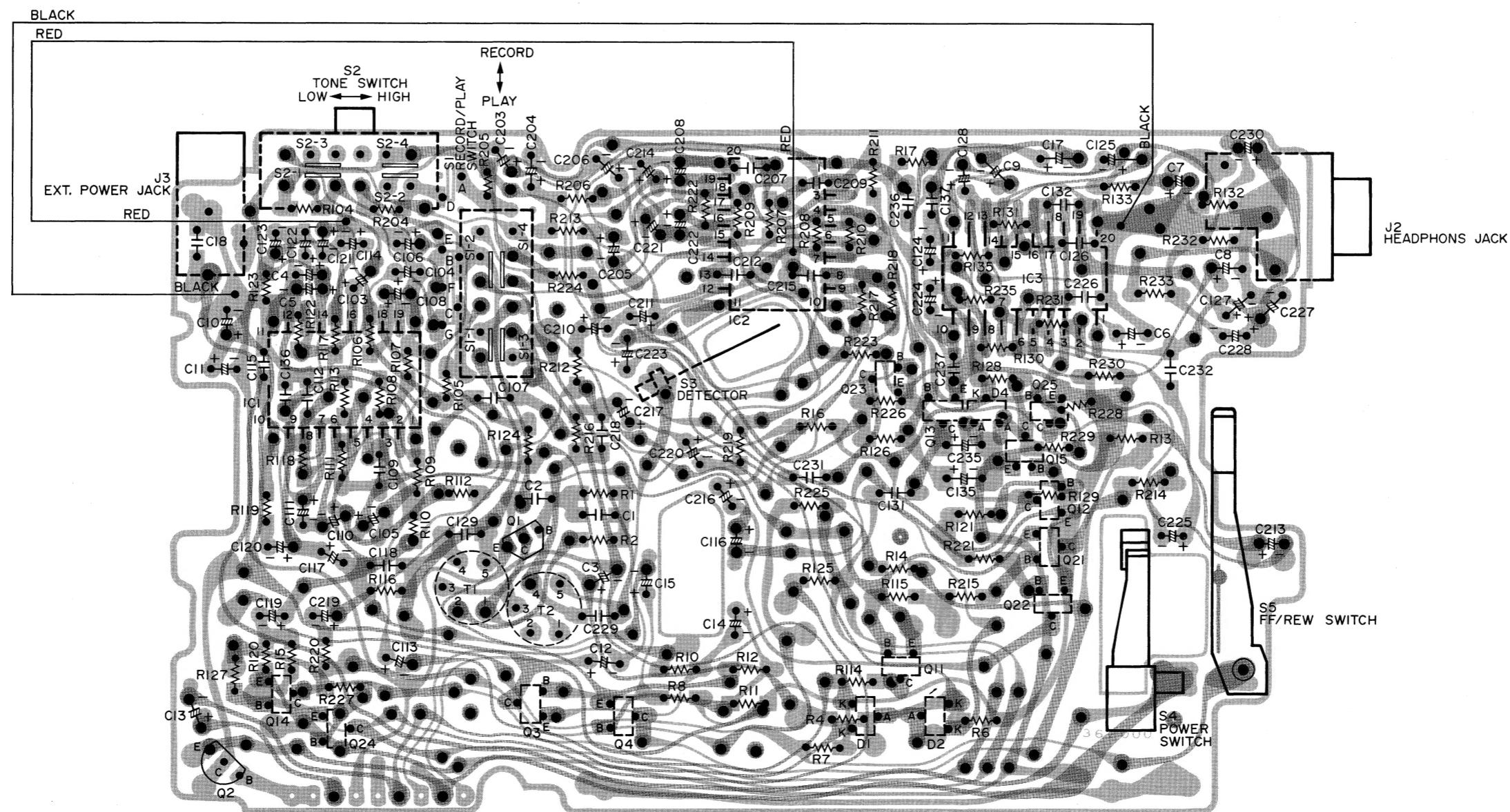
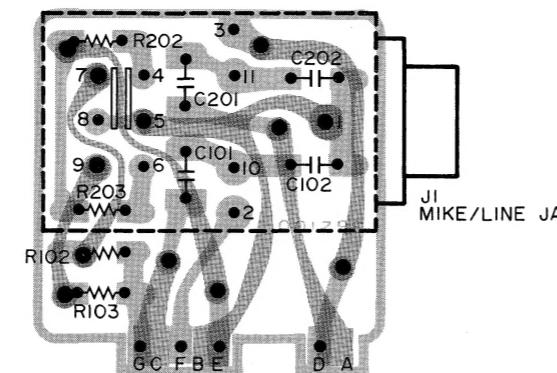
MOTOR GOVERNOR P.C.B. BOARD



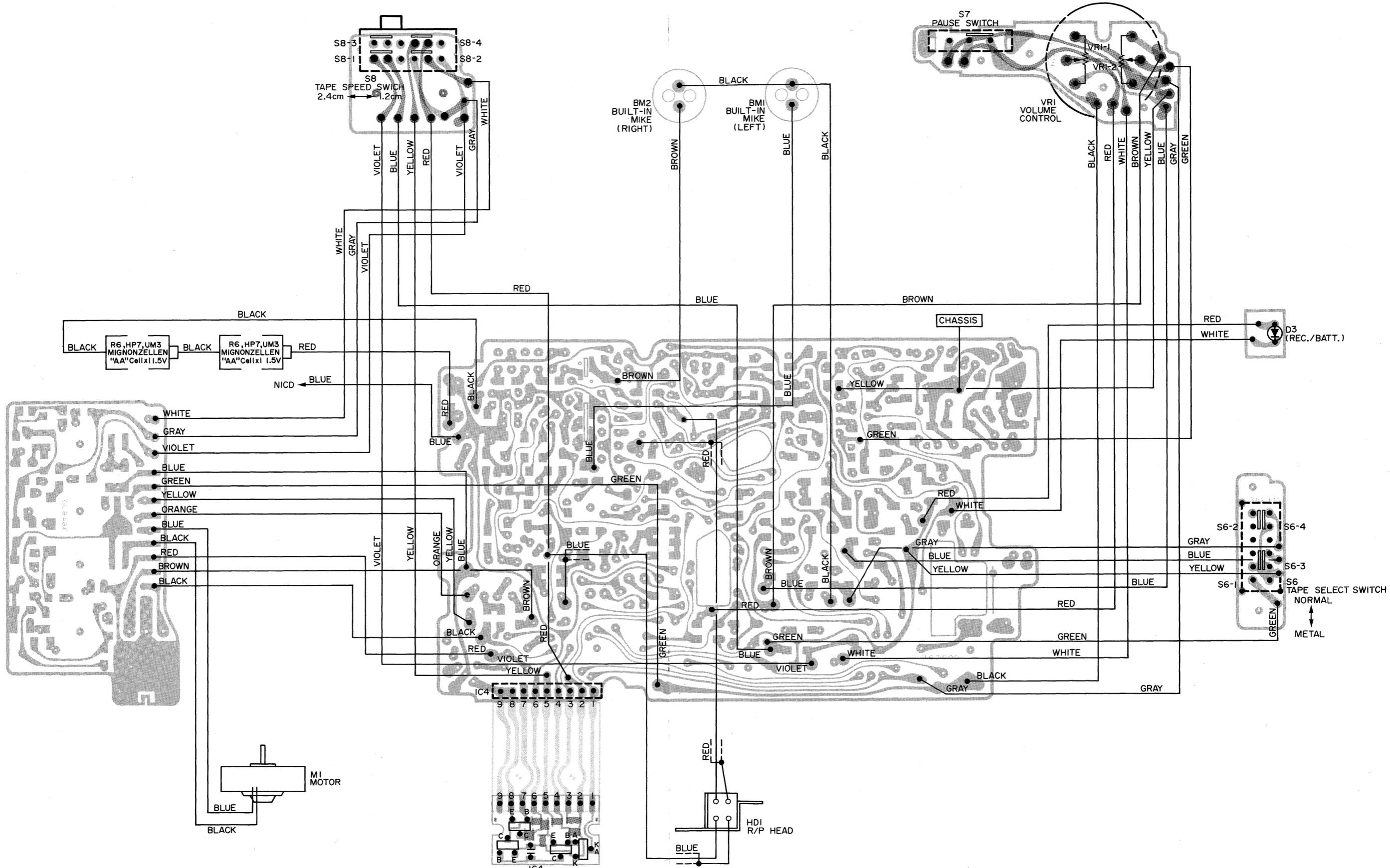
μ PC1217G BLOCK DIAGRAM



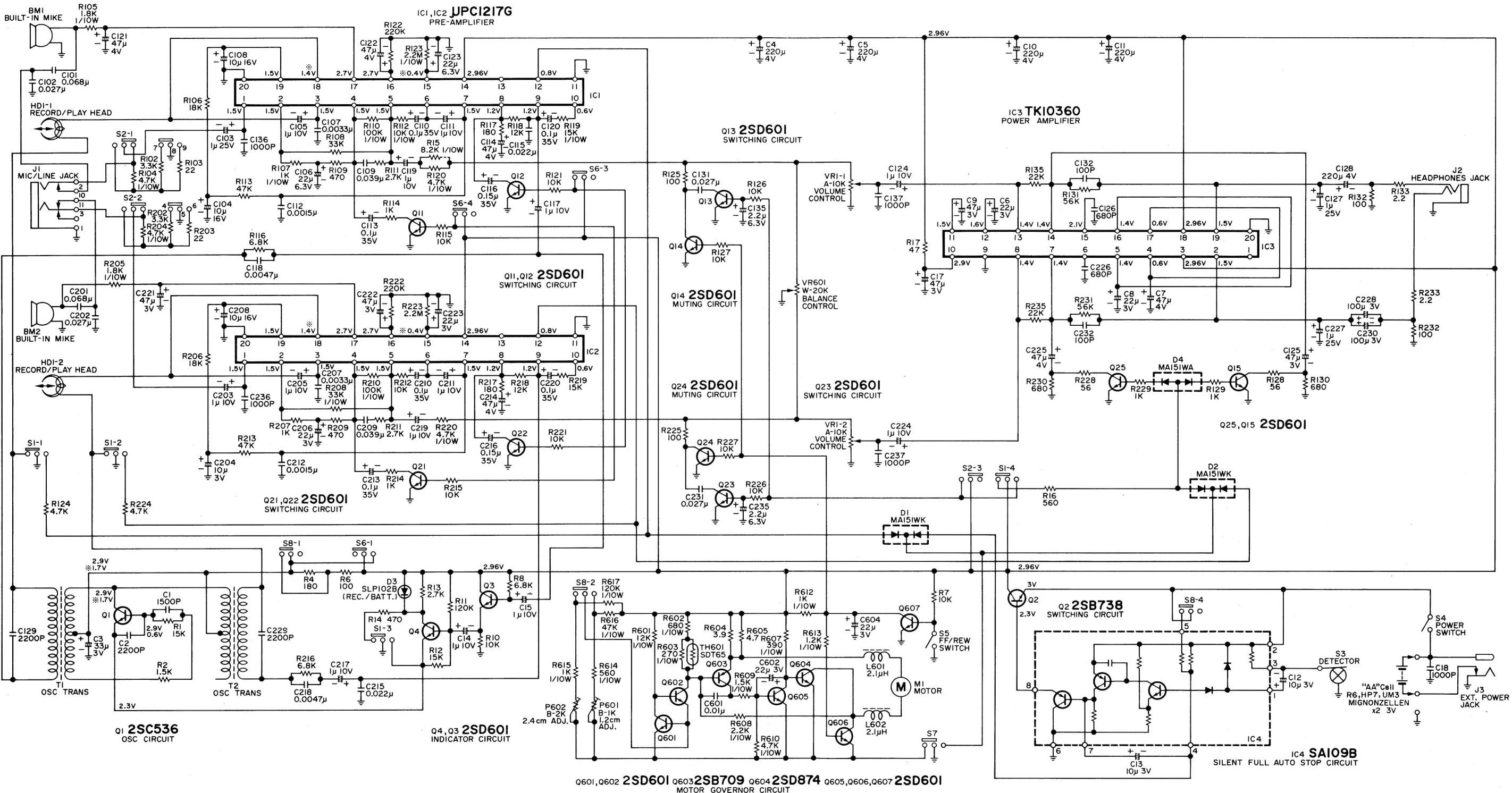
AMPLIFIER P.C.BOARD



WIRING DIAGRAM



SCHEMATIC DIAGRAM



No.	Name	Position	No.	Name	Position
S1	Record/Playback Switch	PLAY	S5	F.FWD/REW Switch	NORMAL
S2	Tone Switch	HIGH	S6	Tape Select Switch	NORMAL
S3	Detector	STOP	S7	Pause Switch	OFF
S4	Power Switch	OFF	S8	Tape Speed Switch	2.4cm